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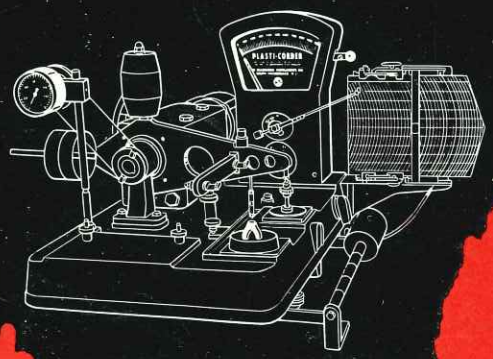
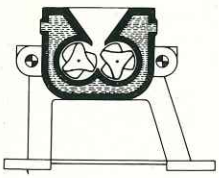
Measure Processability by Processing in Miniature



C.W. BRABENDER PLASTI-CORDER®

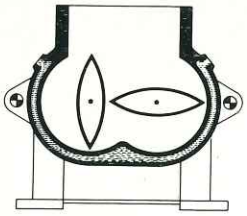
The chemical industry's model of the time-proven Brabender Plastograph.

PLASTI-CORDER MEASURING HEADS



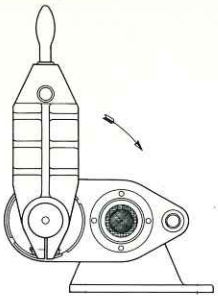
HIGH SHEAR MIXERS:

Size: 50 and 25
Mixing Rotors: Cam, Roller, Screw, Delta
Jacket Heat
Control: Heat transfer liquid, electric



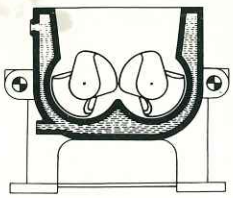
INTER-MESH MIXERS:

Size: 300
Mixing Rotors: Sigmoidal, Conoidal, Pin
Jacket Heat
Control: Heat transfer liquid, electric
(other rotor configurations available)



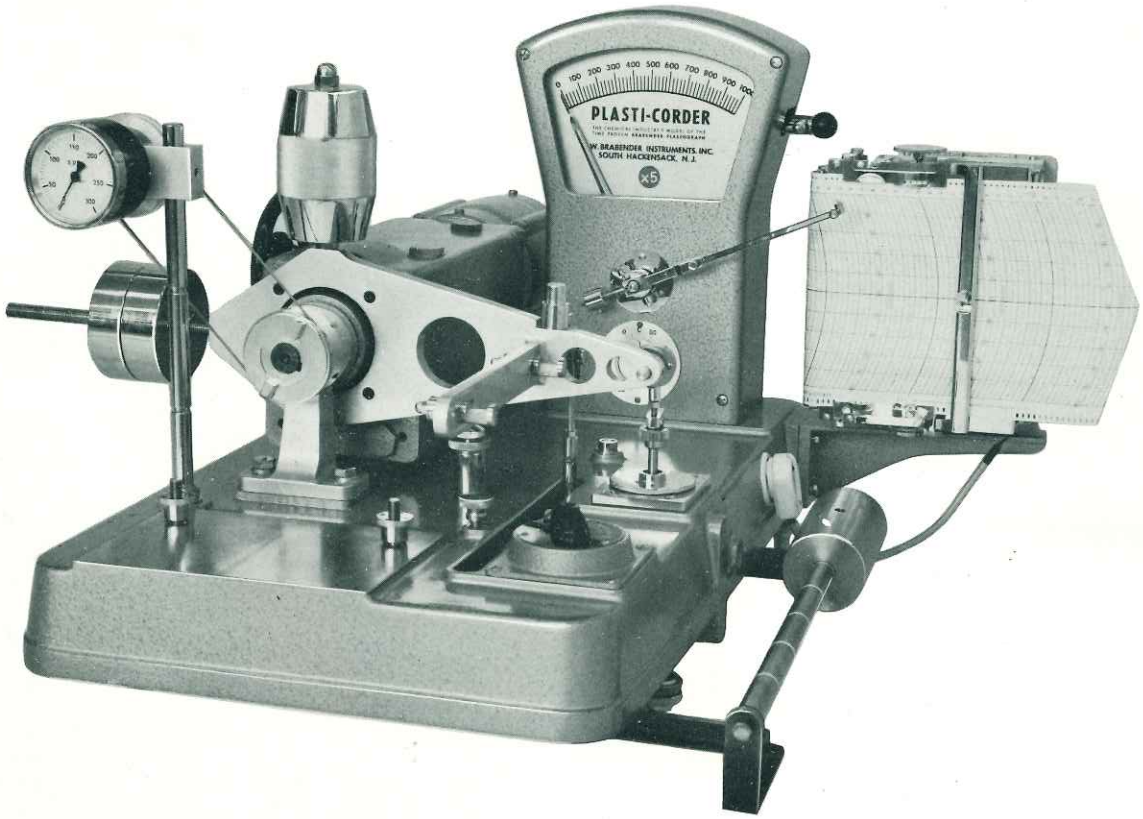
SHEARING DISK RHEOMETER:

(ASTM designation: D-1646-63)
Rotor: 1.500 ± .001″ (Serrated)
Test Cavity: 2.000″ w/allowable tolerances
Closure: Adjustable Hydraulic Pressure



LOW SHEAR MIXERS

Sizes: 50 and 300
Mixing Rotors: Sigma, Delta
Jacket Heat
Control: Heat transfer liquid, electric



The C. W. Brabender PLASTI-CORDER® utilizes a dynamic test principle with test conditions process-oriented. By use of a large number of different measuring heads, all processing miniatures, one can follow (1) apparent viscosity (flow) of liquid or plastic phase material under various shear rates and temperatures, or (2) consistency (flow) of solid-plastic-liquid phase mixtures. Flow is recorded and the physical (rheological) nature of materials and their processability measured. Such information is much too costly to obtain by plant "trial and error" experimentation. For instance, the polymer melt viscosity of highly viscous plastic resins as a function of plasticizer, stabilizer, antioxidant, and lubricant content, can be measured on a small scale and their processability forecast with the C. W. Brabender PLASTI-CORDER.

The C. W. Brabender PLASTI-CORDER is equipped with twelve sensitivity settings and a means of zero suppression for the measurement from low viscosity (5 poises) to extremely high viscosity (30,000 poises) materials.

Measuring heads are available for testing up to 900°F and up to shear rates of 5000 seconds^{-1}.

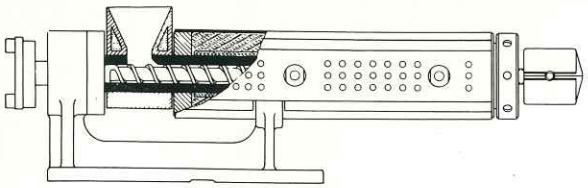
Compounding can be done while recording, thus showing the effect of each ingredient. Time for incorporation is clearly indicated. Dynamic stability of test material to heat and various atmospheres can be determined.

The C. W. Brabender PLASTI-CORDER is truly a table top pilot plant. Measuring heads simulating various processes are quickly interchangeable. The material under test is subject to the same conditions of shear force, shear rate, and temperature which the material encounters in process.

This reliable, accurate bench type testing instrument, with reproducibility within 1%, replaces costly large scale pilot plant equipment. Research and Development as well as production personnel are well aware of the savings in time and expense this type of testing means to them. Savings in test material alone often pay for a C. W. Brabender PLASTI-CORDER installation in a few experiments.

The C. W. Brabender PLASTI-CORDER is not only an instrument for the laboratory, but because of its sturdy construction and compact design, equally suited for plant process control.

The picture shows one of the models of the C. W. Brabender variable speed PLASTI-CORDER—the ultimate in instrumentation for the measurement of flow over a wide range of shear rates.

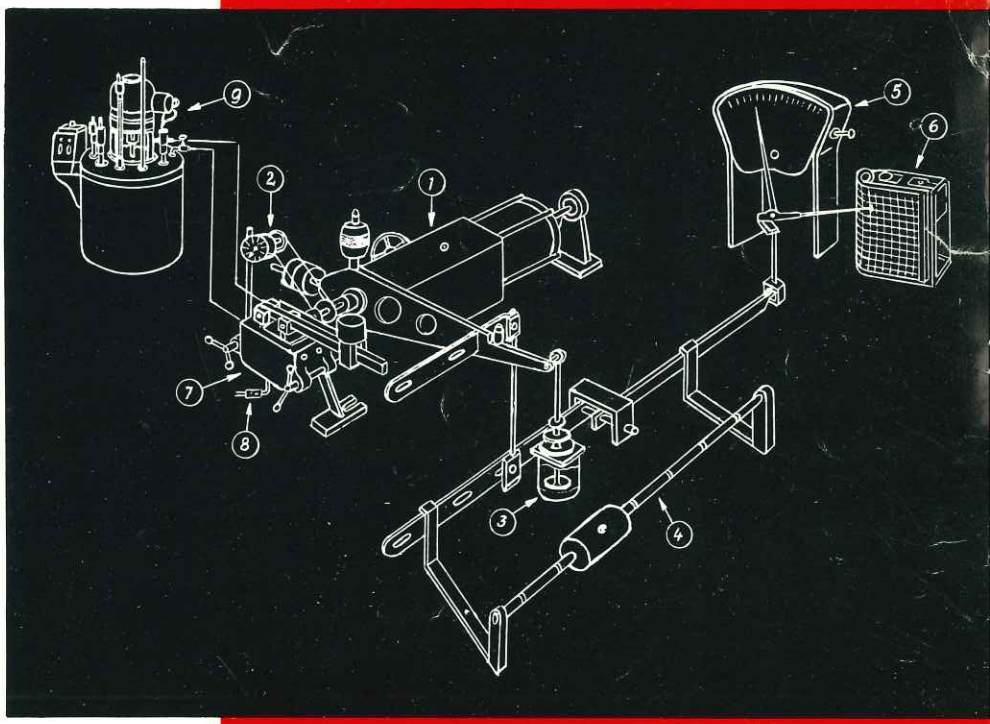


EXTRUDERS—¾"

L/D Ratio: 10:1, 20:1, 25:1
Screws: Various
Dies: Various
Barrel & Die
Heat Control: Heat transfer liquid, electric

ACCESSORIES:

Various closures, filling devices, seals, feeders, thermocouples, temperature recorders, and means of ambient control are available for mixers. Various items including feeders, additional temperature ports, special dies, ambient controls, and pressure measuring devices, are available for extruders.



A large number of specialized measuring heads have been built over the years including continuous on-stream measuring heads. Our Engineering Department will gladly study your special problems. Many solutions to special problems are already available. Many measuring heads are easily modified for continuous measurement of flow. Torque's electrical analogue can be provided.

Industries manufacturing or using the following materials (or their compounds) are among those widely using the C. W. Brabender PLASTI-CORDER for research, development, quality control and production.

Adhesives
Carbon Black
Ceramics
Chocolate
Cosmetics
Detergents
Dry Milk Solids
Elastomers
Electrode Pastes
Floor Covering
Food Products
Foundry Sand
Gels
Greases
Lubricants
Meat Fillers
Ointments
Paint
Pastes
Pigments
Putty
Rubber
Sealants
Shortening
Stabilizers
Thermoplastics
Thermosets

The rotors of the measuring head (7) are driven by a dynamometer (1) which is free to rotate between precision bearings. Speed is set by hand wheel (left side of dynamometer) according to tachometer (2). The measuring head rotors encounter a resistance torque from the test material causing the dynamometer to rotate in the opposite direction. The reaction torque acts through a lever system of analytical balance precision on an indicator (scale) (5), simultaneously recording on a strip chart recorder (6). The movement of the lever system is damped by an oil dash pot (3). By sliding the weight on the arm (4), the zero can be suppressed several times, thus transposing the sensitivity range without influencing the sensitivity setting. There are 12 sensitivity settings based on three different connector positions in the lever system and 5 settings in the indicator scale (5). The measuring head (7) is equipped with a stock temperature thermocouple (8)—(can also be equipped with a jacket temperature thermocouple), is jacketed for constant temperature control in conjunction with a pressure circulator (9) covering the range up to 325°C. Beyond 325°C an electrically heated and controlled measuring heads can be provided.

SPECIFICATIONS

Dynamometer system:

Various output shaft torques and speed ranges (fixed and stepless variable) are available depending on model selected. Certified torque curves can be provided. Constant horsepower drives are used because of the large output torque available in usual operating ranges. Speed control is optimum. Guaranteed constancy of speed under all loads is possible by a-c position motors. The measuring head is connected to the dynamometer through a coupling with shear pin protection.

Lever system:

The instrument can be set at twelve different sensitivity ranges by adjustment of upper and lower lever arm connectors and adjustment of the torque indicator (scale). The zero can be suppressed many times. Viscosity/consistency is indicated by the pointer on the scale, the latter being divided into 1000 units (20 unit graduations). Unit value depends on the sensitivity range selected. The most commonly used range provides 1000 meter-grams of torque over the 1000 unit scale. The most sensitive range is 200 meter-grams over the scale.

Recording system:

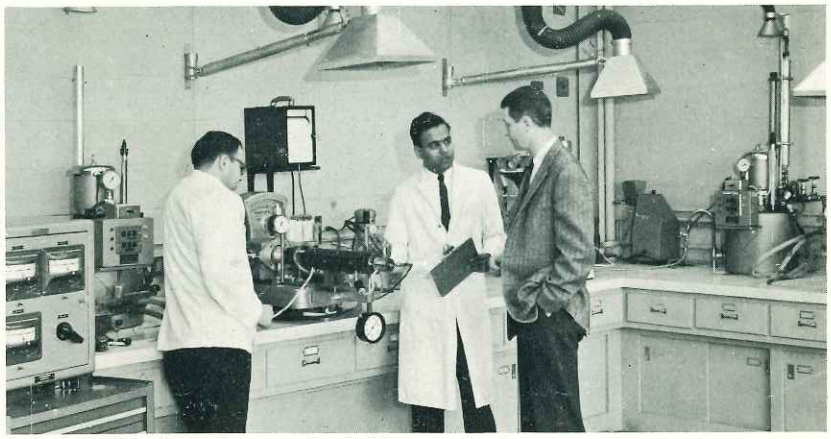
The built-in synchronous motor driving the strip chart recorder, is coupled with the indicator (scale), and is automatically switched on and off by operating the main switch of the Plasti-Corder, and/or can be stopped during operation. Normal chart paper transport is 10 mm. per minute. Other speeds can be provided upon request. A piston-type oil dash pot is provided in order to adjust the oscillation of the lever system to a readable band width on the strip chart recorder.

Current characteristics:

Most equipment is provided for 220 Volt, 60 cycle current. Other possibilities exist. (See specifications on quotations for specific models.)

Dimensions:

A typical Plasti-Corder installation has a shipping weight of 500 lbs. Weight and dimensions can be provided on specific models and specific Plasti-Corder combinations of components. (See specifications on quotations.)



In one large, modern facility—over 30 years of experience in processability testing instruments, research, design and manufacture.

CWB

C.W. BRABENDER INSTRUMENTS

C. W. Brabender founder and inventor. Not affiliated with any other U.S. Company using his name.

South Hackensack, N.J.—50 East Wesley Street/343-8425, Area Code 201